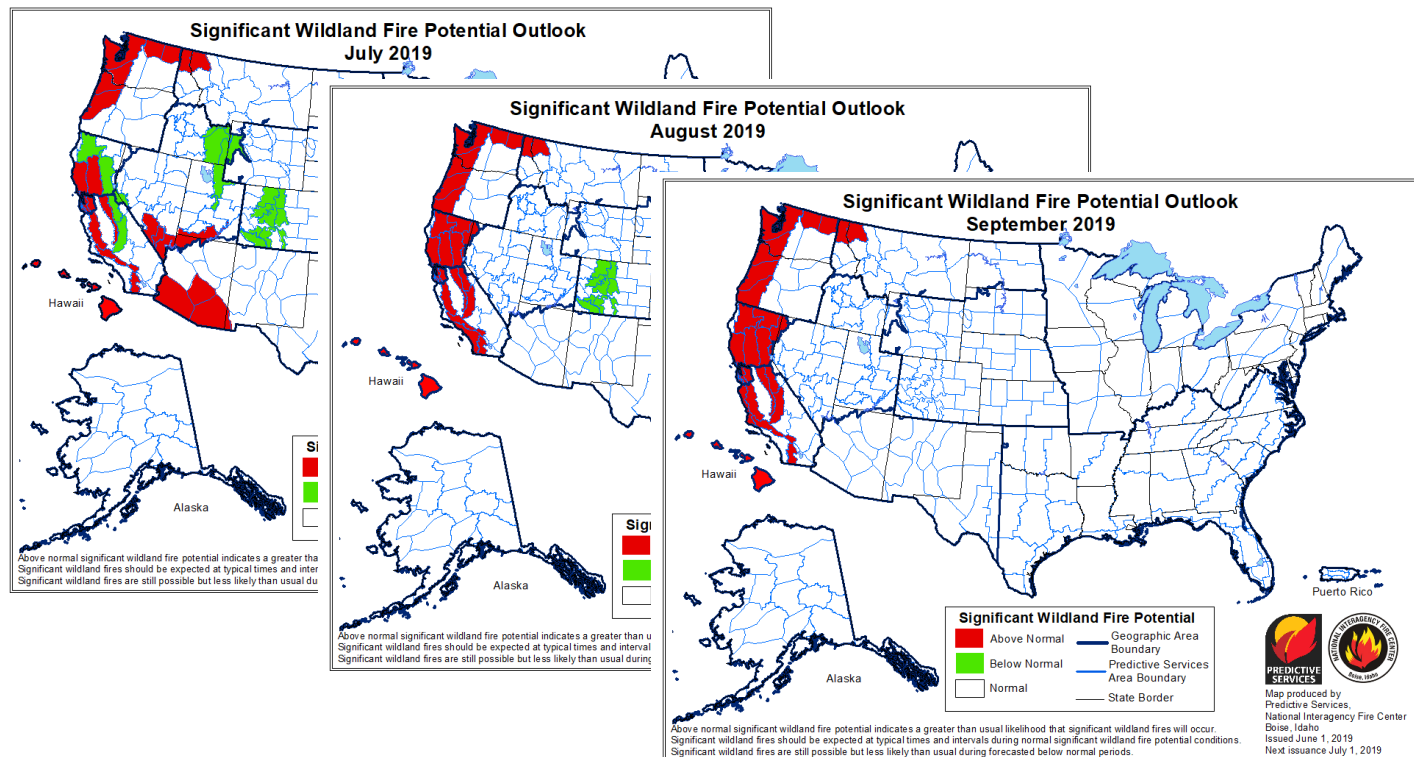


TETON INTERAGENCY FIRE 2019 WILDLAND FIRE OUTLOOK

June 3, 2019



Significant Wildland Fire Potential for July, August and September 2019 (issued June 1 2019, National Interagency Fire Center. <https://www.predictiveservices.nifc.gov/outlooks/outlooks.htm>.

SUMMARY

Fire season outlooks for the Teton Interagency Dispatch area and for the Great Basin Geographic Area reflect the continuing effect of winter snowpack and spring moisture, with an outlook for a below-normal fire season in June-July and a normal fire season in August and September.

As a result of winter moisture, lower elevation areas with grass/forb fuels may experience an increased fuel loading that in turn may intensify fire spread/intensity if a drying-curing trend occurs. The fire season may be impacted by weak *El Niño*-Southern Oscillation (ENSO) conditions and by an outlook for a delayed and eastward-tracking trend of our typical mid-summer monsoon moisture flow from the Southwest.

Current 30- and 90-day probability outlooks indicate a summer fire season with **a transition from normal to potentially above normal temperatures later in the fire season**, which may be balanced by **a 50% probability of above-normal moisture for the summer (June through August)**. July and August are our driest months, so the timing and amount of moisture may determine the degree to which the potential for above-normal moisture may be a limiting factor for fire activity.

*

The Teton Interagency Wildland Fire Outlook is updated monthly. Current information on fire conditions, fire indices and fire activity can be found at www.tetonfires.com, with local outlooks and related regional and national outlooks at <https://qacc.nifc.gov/qbcc/dispatch/wy-tdc/home/predictive-services/outlooks>.

WEATHER PATTERNS

The weather pattern for the water year to date (as tracked in national climatological rankings at <https://www.ncdc.noaa.gov/temp-and-precip/climatological-rankings/>) featured:

PRECIPITATION – Wet but variable

- A wetter than normal winter occurred throughout the Teton Interagency dispatch area.
- Based on records beginning in 1895, for all Wyoming climate divisions, moisture for the water-year-to-date (October-April) was the 83rd driest (42nd wettest) on record.
- In the Western Wyoming/Teton Climate Division 2 - Snake Drainage, moisture for the water-year-to-date (October-April) was the 38th wettest on record. February was the 4th wettest on record yet March was 24th driest.
- In the Southwestern Wyoming Climate Division 3 - Green and Bear Drainage, moisture for the water-year-to-date (October-April) was the 22nd wettest on record. Compared to the Snake Drainage, the late-winter pattern was reversed – February was the 104th driest on record yet March was 32th wettest.
- The Moose, WY weather station recorded five of eight months with below normal precipitation (averaging 61% of normal), which contrasted with wetter-than-normal months in November, February, and April, with February totals reaching 430% of normal moisture (see Table 2 and Graph).

TEMPERATURE – Cooler than Normal, but not everywhere

- For all Wyoming climate divisions, the prior seven-month period (October-April) was the 41st coolest on record.
- In the Western Wyoming/Teton Climate Division 2 - Snake Drainage, the prior seven-month period (October-April) was the 51st warmest (74th coolest) on record.
- In the Southwestern Wyoming Climate Division 3 - Green and Bear Drainage, the prior seven-month period (October-April) was the 39th coolest (86th warmest) on record.

FIRE ACTIVITY OUTLOOK – Below Normal for June and July, Normal for August and September.

Regional outlooks (as of June 1) indicate below normal fire activity for June-July and normal fire activity for August-September in the Teton Interagency response area, with similar outlooks for the rest of Wyoming.

During a normal season, Bridger-Teton National Forest will have 67 fires for 3290 acres (40-year average from 2016) and Grand Teton National Park will average 11 unplanned fires for 1858 acres (based on a 20-year fire history, 1997-2016).

CLIMATE AND FUELS

(1) Area Snowpack and Streamflow

Snowpack, accumulated precipitation, and streamflow in western Wyoming tracked above normal for this water year, with higher than normal snow water equivalency content (SWE) at higher elevation sites, and total water-year-to-date at slightly above normal. Some mid- and lower-elevation SNOTEL sites received a more normal SWE and a slightly earlier than normal snowmelt.

Table 1: Percent of 30-Year Average Snow Water Content and Precipitation by Basin. 6/2/19.
(<http://www.wrcc.dri.edu/snotelanom/snotelbasin>). * = Analysis may not be valid measure of conditions.

	Snow Water Content	Total Precipitation (Water YTD)
Snake River	149 %	106 %
Upper Green River	245 % *	105 %
Yellowstone	189 % *	113 %
Wind River	307 % *	104 %

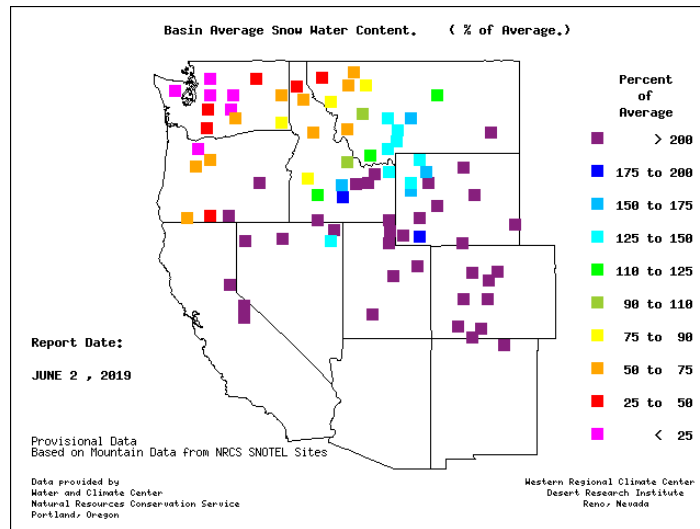


Figure 1a: [Basin - Percent of Average - Snow Water Content](#)

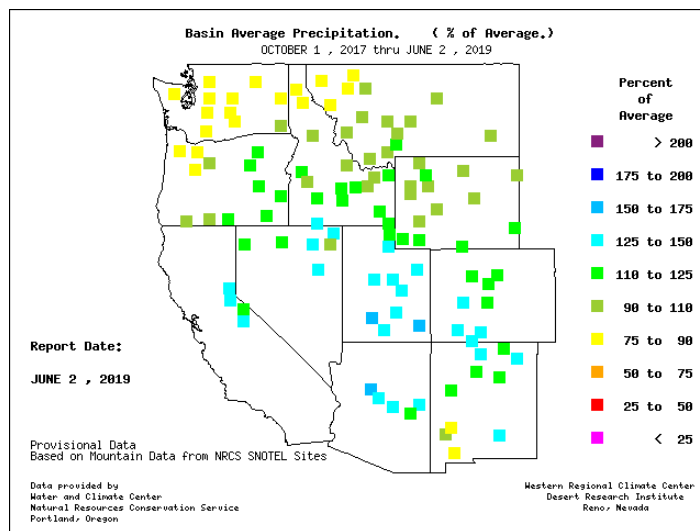


Figure 1b: [Basin – Percent of Average – Precipitation](#)

Figures 1 c-e. SNOTEL Water Year to Date, Snow Water Equivalent for Grassy Lake (North Zone), Elkhart Park Guard Station (East Zone), and Snider Basin (West Zone). Generally, these representative sites exhibited above normal moisture (in total precipitation and snow water equivalent), with normal to slightly extended snowmelt period, though slightly earlier than normal at Snider Basin, the Wyoming Range site).

Station (499) WATERYEAR=2019 (Daily) NRCS National Water and Climate Center - Provisional Data - subject to revision
Sun Jun 02 15:37:07 GMT-08:00 2019

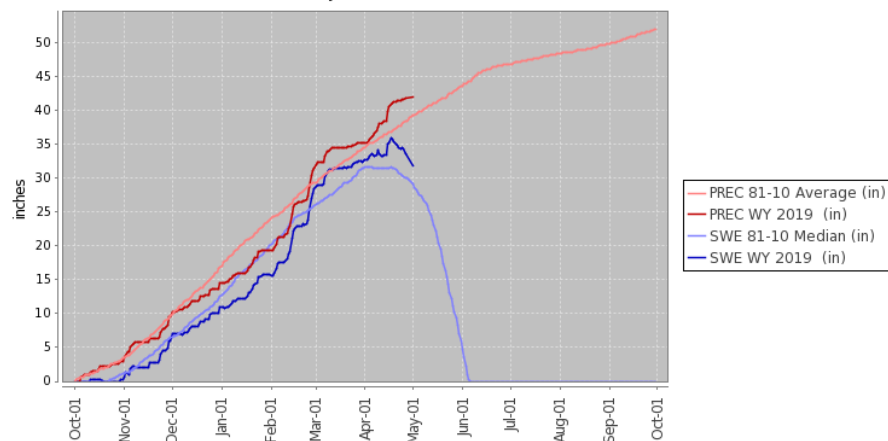


Figure 1c: Grassy Lake Snotel (Teton Zone). <http://wcc.sc.egov.usda.gov/nwcc/site?sitenum=499>

Station (468) WATERYEAR=2019 (Daily) NRCS National Water and Climate Center - Provisional Data - subject to revision
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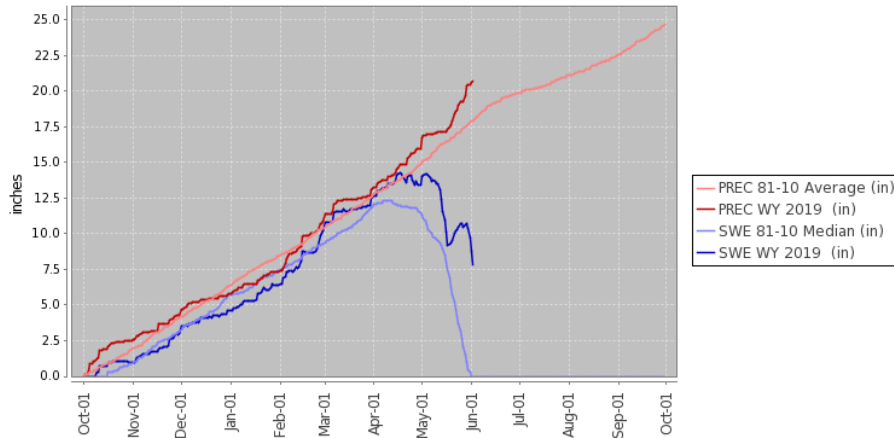


Figure 1d: Elkhart Snotel (Wind River Zone). <http://wcc.sc.egov.usda.gov/nwcc/site?sitenum=468>

Station (765) WATERYEAR=2019 (Daily) NRCS National Water and Climate Center - Provisional Data - subject to revision
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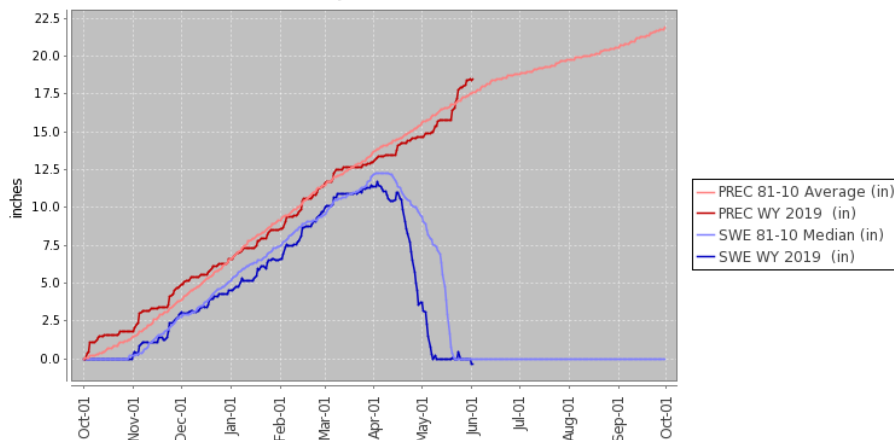
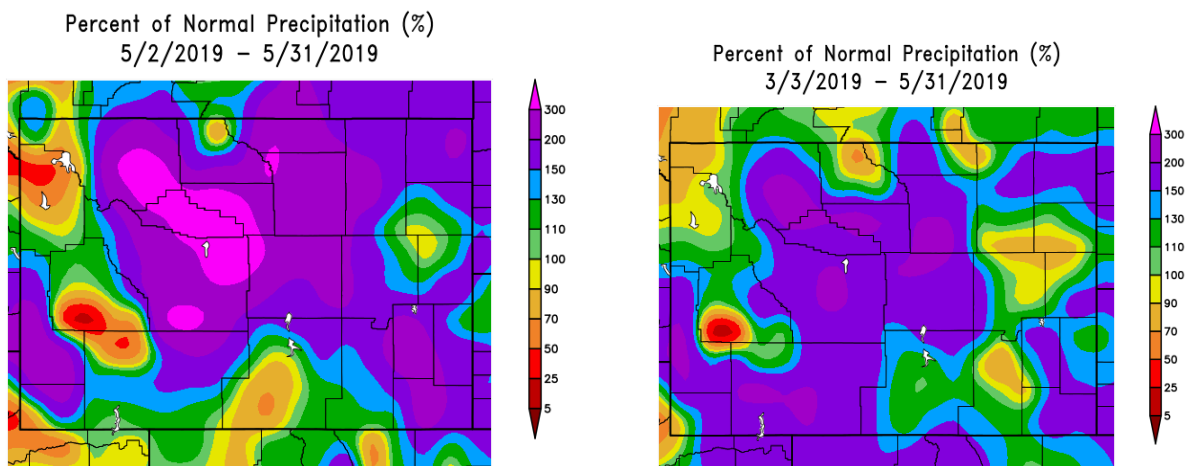


Figure 1e: Snider Basin Snotel (Wyoming Range Zone). <http://wcc.sc.egov.usda.gov/nwcc/site?sitenum=765>

(2) Year-to-Date Precipitation

Area precipitation for the water year to date (October through May) likely reflects current weak *El Niño* conditions that began in the fall of 2018, with the TIDC area generally receiving above-normal moisture, though there is significant variability in moisture patterns.



Generated 6/1/2019 at HPRCC using provisional data.

NOAA Regional Climate Centers Generated 6/1/2019 at HPRCC using provisional data.

NOAA Regional Climate Centers

Figure 2a (left). Wyoming, Current Precipitation – Percent of Normal -- for the past 30 days ending May 31, 2019. <https://hprcc.unl.edu/products/maps/acis/subrgn/WY/30dPNormWY.png>. Areas of the TIDC North Zone and West Zone received below normal precipitation with nearby areas receiving significantly

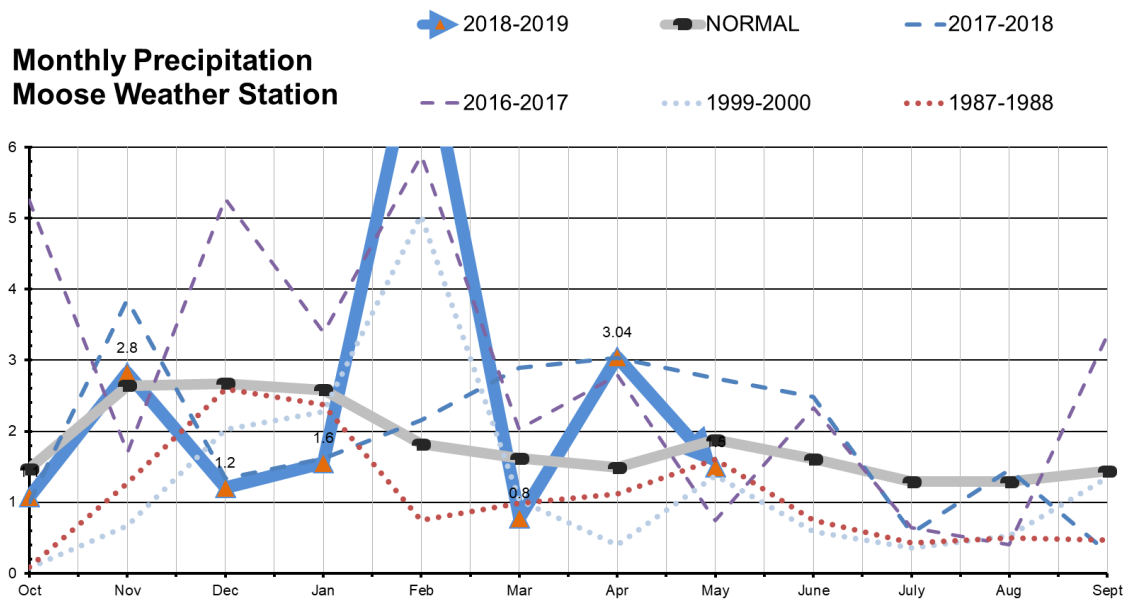
above normal precipitation. **Figure 2b (right)**. This above-normal moisture pattern is more prevalent for the prior 90 days of Precipitation – Percent of Normal, with central areas receiving significantly above normal moisture with some variability, with “shadows” of below-normal precipitation.

<https://hprcc.unl.edu/products/maps/acis/subrgn/WY/90dPNormWY.png>

Precipitation tracking at the [Moose weather station](#), which is representative for lower elevation sites in Grand Teton National Park and some North Zone sites, recorded five of eight months with below normal precipitation (averaging 61% of normal). These months contrasted with three much-wetter-than-normal months – November, February, and April. Average moisture during these three months was 247% of normal, with February receiving 430% of normal moisture (Table 2 and Graph).

Area-wide moisture tracking for the past 30 days (Figure 2a) and the 90-day moisture trend (Figure 2b) indicates a drier May but overall a wetter late-winter and spring.

Table 2 and Graph: Precipitation at Moose Weather Station (Grand Teton National Park).



		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	YTD total
Monthly Precipitation (inches)	1987-88	0.09	1.27	2.59	2.37	0.75	0.99	1.12	1.61	10.79
	1999-00	0.08	0.67	2.03	2.27	5.04	1.03	0.4	1.38	12.9
	2016-17	5.25	1.7	5.27	3.39	5.88	2.03	2.79	0.74	27.05
	2017-18	1	3.85	1.34	1.62	2.15	2.89	3.03	2.74	18.62
	Normal	2.58	1.82	1.62	1.49	1.88	2.58	1.82	1.62	16.17
	2018-19	1.08	2.82	1.21	1.56	7.83	0.78	3.04	1.5	19.82
Percent of NORMAL	1987-88	6%	60%	102%	92%	40%	63%	75%	84%	70%
	1999-00	6%	32%	80%	88%	267%	66%	27%	72%	83%
	2016-17	357%	64%	197%	131%	323%	125%	187%	39%	167%
	2017-18	68%	146%	50%	63%	118%	178%	203%	146%	115%
	2018-19	73%	107%	45%	60%	430%	48%	204%	80%	123%

(3) Drought Monitor

The current drought map for the U.S. West shows 13% of the West with drought conditions, similar to 2017 at this time (with 17% drought), but notably recovered, compared to 61% of the West with drought conditions at this time last year. In Wyoming, 4.58% of the state exhibits some level of drought conditions, comparable to 7% exhibiting drought conditions at this time in 2017 and demonstrating drought recovery compared to 14% drought conditions this time last year.

Figure 3a. U.S. Drought Monitor – West. <https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?West>

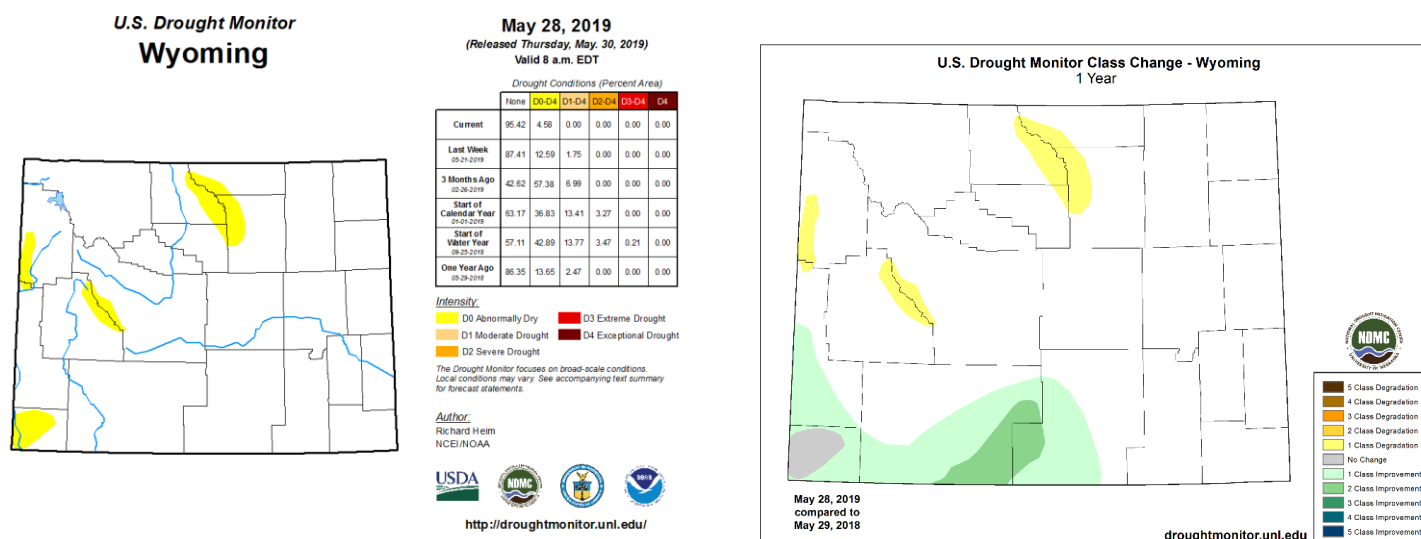
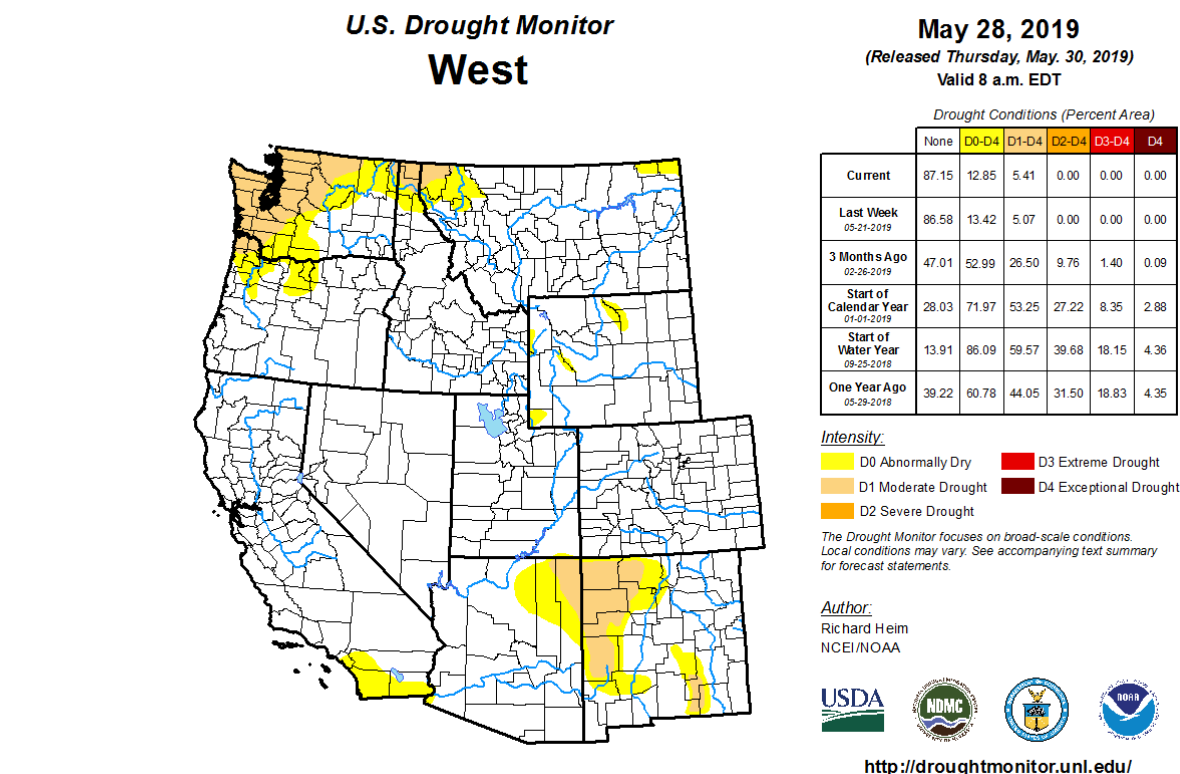


Figure 3b (left). U.S. Drought Monitor – Wyoming – May 28, 2019. <https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?WY>. Figure 3c (right). One year (52 week) comparison. https://droughtmonitor.unl.edu/data/chng/png/20190528/20190528_WY_chng_52W.png.

(4) Oceanic Niño Index (for tracking *El Niño* / *La Niña* / ENSO-Southern Oscillation)

The Oceanic Niño Index (ONI) (<http://ggweather.com/enso/oni.htm>) offers a streamlined tool for tracking *El Niño* (warm) and *La Niña* (cool) events in the tropical Pacific. In summer 2016 we transitioned to ENSO-neutral followed by alternating periods of weak *La Niña* and neutral conditions, which transitioned in fall of 2019 to weak *El Niño* conditions.

CURRENT STATUS:

- *El Niño* is likely to continue through the Northern Hemisphere summer 2019 (70% chance) and fall (55-60% chance).
- The majority of models predict a weak *El Niño* to continue into winter 2019-20.
- Weak *El Niño* conditions may be associated with recent (April-May) anomalous high-pressure ridges (and warmer temperatures) in the Northwest and British Columbia, and the Eastern US, and low-pressure troughs (and cooler temperatures) in the Southwest and Central US.
- Current updates at <http://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/enso.shtml>.

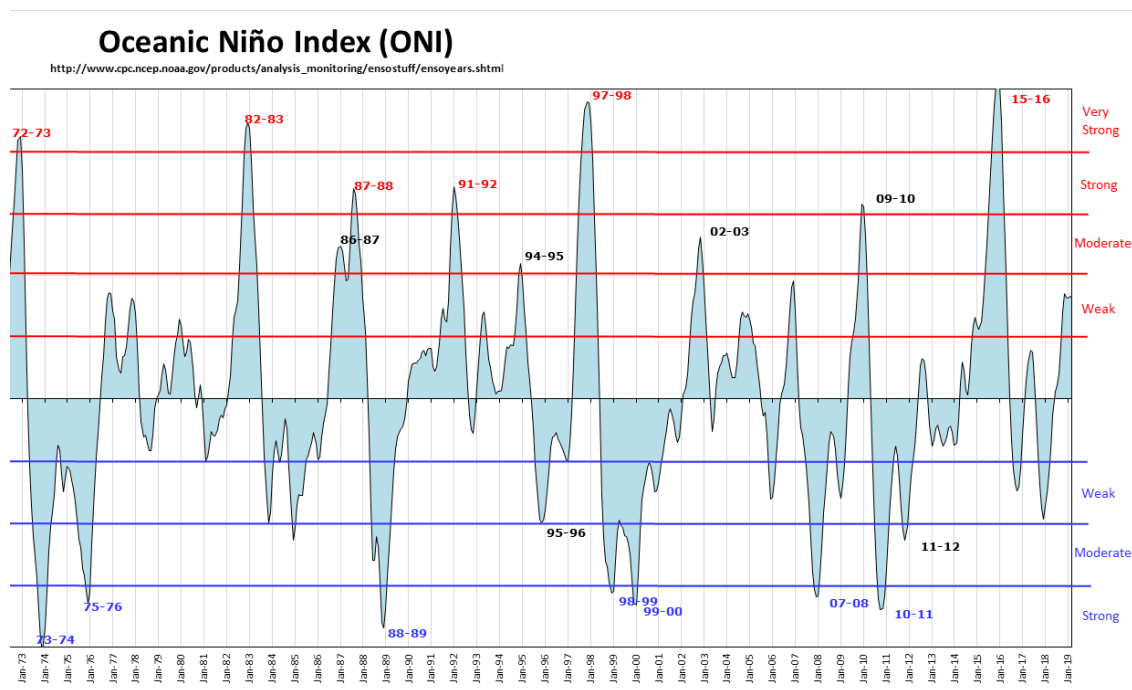
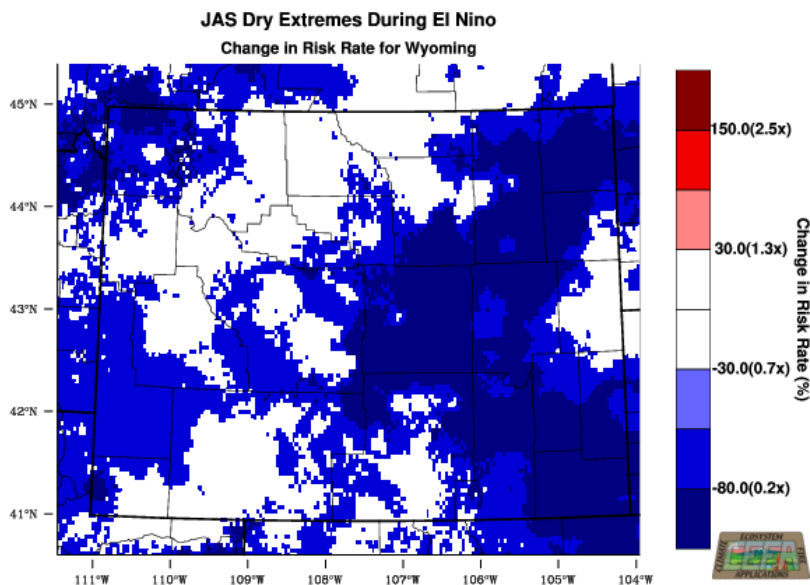


Figure 4a. Oceanic Niño Indicator (cropped) tracks the strong *El Niño* conditions of 2015-2016, followed by transition to weak *La Niña* conditions in 2016-2018. These conditions may have been linked to the transition from the dry 2016 summer to the warmer and wetter winters of 2016-2017 and 2017-2018. The current weak *El Niño* conditions began in the fall of 2018. <http://ggweather.com/enso/oni.htm>.

El Niño/ENSO Impacts: Monthly and seasonal risk assessment maps from the Desert Research Institute offer a visual analyses of changes in wet/dry and warm/cool probabilities under *El Niño*/ *La Niña* conditions. Seasonal risk analysis down-scaled to the state level are at <http://www.wrcc.dri.edu/enso/ensorisk/index.html>.



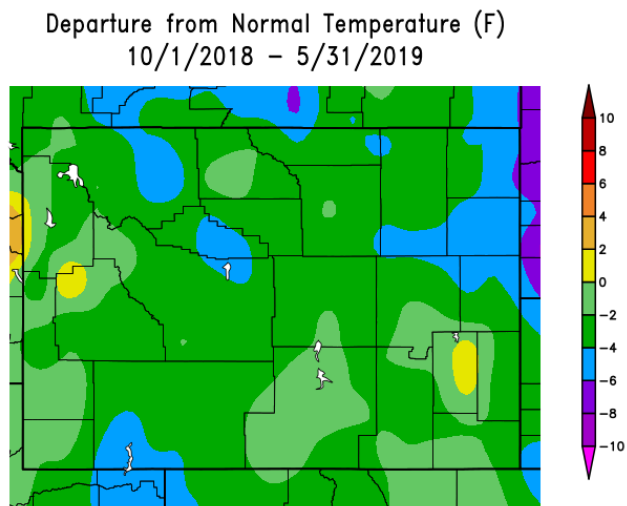
For July-August-September, *El Niño* conditions historically have reduced the risk for dry extremes for most of Wyoming (Figure 4b, https://wrcc.dri.edu/Graphics/Maps/ENSO/EINiño_Dry/JAS/wy_cl.png).

(5) Fuel Moisture

Initial fuel moisture sampling in Grand Teton National Park shows green-up occurring at a typical rate, with some open, lower elevation sites reflecting a slightly earlier green-up. Initial fuel sampling measurements show live woody fuel moistures in sagebrush as drier than normal for June 1, with live woody moisture in conifers tracking near normal.

(6) Long-term Temperature and Precipitation Trends and Outlook

COOLER WINTER. This winter was cooler than normal in the Teton Interagency area (see Figure 6a).



Generated 6/1/2019 at HPRCC using provisional data.

NOAA Regional Climate Centers

Figure 6a. Departure from Normal Temperature, Wyoming, October 1 2018 through May 31, 2019 (Water Year-to-Date) indicates a cooler winter than normal and when compared to 2017-2018.

<https://hprcc.unl.edu/products/maps/acis/hprcc/wy/WaterTDeptHPRCC-WY.png>

TEMPERATURE

PRECIPITATION

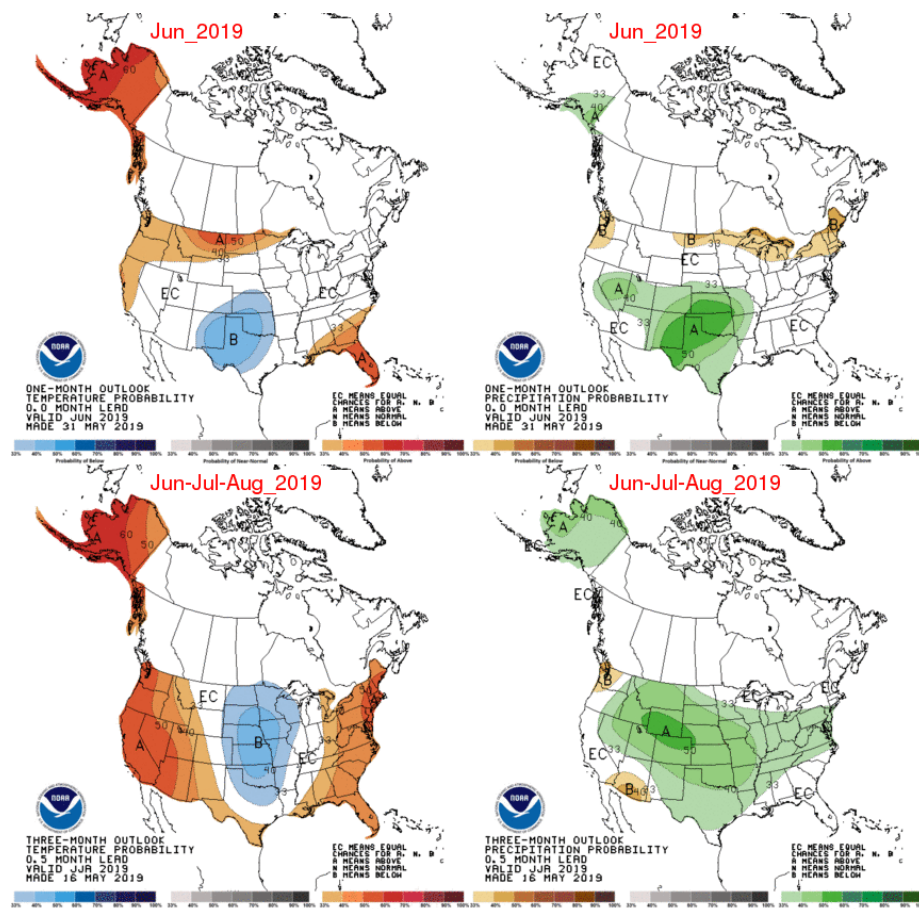


Figure 6b: June and June through August, 30- and 90-day Outlook.

SEASON OUTLOOKS – Normal temperatures warming later, with wetter than normal

precipitation: The 30- and 90-day temperature outlook (Figure 6b, left) calls for normal temperature ranges for June (potentially warmer in far northern Wyoming) and 40% probability of above-normal temperature ranges for the summer overall (June through August). The precipitation outlook (right) indicates a normal precipitation range for June and 50% probability of above-normal moisture for the summer (June through August).

(http://www.cpc.ncep.noaa.gov/products/predictions/multi_season/13_seasonal_outlooks/color/page2.gif).

GEOGRAPHIC AREA OUTLOOKS

The Teton Area fire zone is within the Great Basin Geographic Area. Fire seasons in our zone also track with similar conditions in adjacent areas within the Rocky Mountain and Northern Rockies geographic areas, which converge within the Greater Yellowstone Area (GYA) and share common trends of fire activity. The season outlooks excerpted below support an outlook for normal fire activity in the Teton Interagency Dispatch area, with potential for above-normal fire activity by August in western and northern areas of the Great Basin geographic area.

Excerpts of National - Regional Outlooks from “National Wildland Significant Fire Potential Outlook” (June 1, 2019, NICC Predictive Services). http://www.nifc.gov/nicc/predictive/outlooks/monthly_seasonal_outlook.pdf.

National – Fire Activity Outlook

Fire activity continued to be well below average during May as a cool, wet pattern redeveloped over the West during the second week of the month and persisted through month’s end. High elevation locations in many areas received late season snowfall that further slowed snowpack melting rates. Middle and lower elevations

continued to see the development of a robust, continuous grass crop. Drought continued to recede except across Washington State where it persisted and across the Southeast where a slight intensification was observed. Alaska gradually entered its fire season as fuels began to dry and as convective weather patterns developed. With high pressure becoming more entrenched over the eastern Interior as the month progressed, fire activity began to pick up. Entering June, the driest areas remain areas along the Mexican Border, Washington State, and the Southeast.

Greenup is peaking in many areas except across the Southwest where curing and drying has begun to occur already. Elsewhere, the process is progressing at an average or slower than average rate. The ongoing weather pattern has been mostly beneficial to the fire environment, and long-range data does not suggest unusually long lasting hot and dry ridge events across the West in June. The intensity and duration of such events have accelerated the process in recent years. Also, mountain snowpack continues to melt off at a slower than average rate in most areas except along the Canadian Border. The developing grass crop is a concern, especially across portions of California.

As June progresses, the fine fuels will begin to cure and dry from south to north across the West. Lingering high elevation snowpack should be lost. Wildfire activity should begin to increase by late month as peak of the fire season begins to arrive as July and August approach. As is the case with the lower elevation fuels, the high elevation heavy fuels will also experience a delayed entry into the season except along the Canadian Border in Washington State where overall dryness will lead to an average start with a potential for above normal activity. Alaska will reach its peak in June and begin to wind down in July.

Looking ahead to August and September the fire potential and resulting activity should increase to Normal in most areas except along the West Coast where Above Normal significant large fire potential is expected due to fuel loading and preexisting dry conditions. A traditional winding down of the Western fire season is expected in Mid-September as fall moisture begins to arrive.

National – Weather and Climate Outlooks

Latest sea surface temperature anomalies across the equatorial Pacific Ocean indicate that the weak El Niño continues but has slightly weakened in recent weeks. Latest forecast data suggests continued slight weakening might be observed through August before reaching a steady state this fall around +.5 degrees Celsius. Latest data from the models introduces uncertainty into the event beginning mid-autumn as the various model solutions begin to diverge.

Medium to long range model data suggests that a less amplified pattern might continue through the summer months and into the early fall. This would indicate summer temperatures that are less hot than recent years and it might indicate that the Southwestern monsoon might be delayed, perhaps a little weaker, and more easterly-focused than most years. While shorter duration hot high pressure ridge events are to be expected, an increase in the number of westerly flow events could translate to overall breezier conditions and an increase in lightning activity coming in from the West Coast. Storms coming from this source region tend to have better chances of containing some moisture than the monsoonal storms that more typically move north across the West from the Southwest.

Great Basin: Normal significant large fire potential is expected across the region during the outlook period except across the central and eastern portion of the region in June when Below Normal significant wildland fire potential is expected. The Below Normal potential will continue across the eastern Mountains of Utah in July while Above Normal potential will develop across the southern boundary of the region along the Arizona Strip. The majority of the Region is at or above average as far as precipitation over the past 2-3 months. The storm track favored the southern two thirds of the region much of the winter into early spring, then shifted north in April, before bringing more precipitation to the southern two thirds of the Region in May.

Further north, an early fire season is not anticipated with wet weather expected to periodically affect the northern two thirds of the region through at least much of June, if not longer. Small fires can be expected to increase during periods of dry and warm weather across the lower elevations in the fine fuels; however, storm systems will likely still move across the region every week or so and bring periods of cooler and wet weather, which will keep burning periods short. The storms may continue later into June and July, which could further limit the fire potential in the north. The deep snowpack will also delay fire season in the higher elevations of the Sierra into Nevada, Utah, and eastern Idaho. Therefore, Below Normal fire potential is expected in the higher terrain in June and July and across the lower elevations of eastern and southern Nevada into southern

Idaho and much of Utah in June. Currently, Normal fire potential is expected in the lower elevations of northern and western Nevada into northern Utah beyond June. If drier weather resumes by July and August, some areas of Above Normal fire potential may occur in the lower elevations, which could last into September.

CURRENT FIRE ACTIVITY

Fire Activity: Teton Interagency Dispatch Center

Early season wildland fire activity is typically limited to a period after snowmelt and prior to green-up by. The current season has experienced minimal fire activity, limited to four human-caused and one lightning-ignited fire. The largest fire to date occurred on May 13 in Teton County, burning 25.6 acres in lower elevation fine-fuels in the Spring Gulch area. Additional acres treated in prescribed burns will be recorded as mapping is completed.

Table 2: Year-to-Date Fire Activity (Unplanned and Planned Ignitions).

TETON INTERAGENCY FIRE MANAGEMENT AREA TOTALS	Human Fires	Human Acres	Natural Fires	Natural Acres	RX Fires	RX Acres
	4	26	1	0.1	5	1

Selected Sources

- Precipitation Tracking: <https://water.weather.gov/precip/>
- Snow / Snotel Tracking: <https://www.wcc.nrcs.usda.gov/snotel/Wyoming/wyoming.html>
- Climate Prediction Center, Three-Month Outlooks: <https://www.cpc.ncep.noaa.gov/products/predictions/90day/>
- *Regional outlooks from “National Wildland Significant Fire Potential Outlook” (June 1, 2019, NIFC Predictive Services):* https://www.nifc.gov/nicc/predictive/outlooks/monthly_seasonal_outlook.pdf.
- Great Basin Predictive Services/Outlooks: <https://gacc.nifc.gov/gbcc/outlooks.php>.
- Teton Interagency Dispatch: <https://gacc.nifc.gov/gbcc/dispatch/wy-tdc/home/>.

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